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CHRONIC CYSTITIS IN THE FEMALE

AND

MODE OF TREATMENT.

By THOMAS ADDIS EMMET, M. D.,

Surgeon to the New York State Woman's Hospital.



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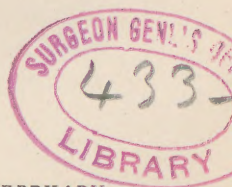
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During the winter of 1858 I removed, through an artificial opening made in the vesico-vaginal septum, a calculus from the bladder of a patient in the Woman's Hospital. She had been an inmate of the institution several years before with a vesico-vaginal fistula, which had been closed previous to her discharge. As the bladder was in a diseased condition, by the advice of Dr. Sims, the artificial opening was left for the greater facility afforded in the treatment for restoring the organ to a healthy state. This idea was a new one to me at that time, and to Dr. Sims I believe is due the credit of the mode of treatment for cystitis in the female resulting from this cause. For the relief of a case of chronic cystitis following exposure and of long standing, I subsequently made an artificial vesico-vaginal fistula, with the view of giving rest to the organ by the free escape of urine. It was thought that by thus removing the exciting cause of the persistent tenesmus the hypertrophy of the walls of the bladder would subside.

This operation and view of treatment was considered original, and during the past nine years it has seldom happened that some case has not been under treatment by this method in the Woman's Hospital.

Prof. Willard Parker, of this city, presented at the annual meeting of the New York State Medical Society for 1867 a paper on "Cystitis and Rupture of the Bladder treated by Cystotomy," which was published in the Transactions for that

year. The Doctor states that on January 3, 1846, he performed lithotomy on a male. He was unable to remove the stone, but the cystitis was relieved by the free escape of the urine through the opening. At the end of three months a fresh attack of cystitis came on, the kidneys became involved, and death resulted. This case seems to have been instrumental in drawing his attention to the subject. He mentions performing the same operation subsequently, but the history of the case and result is imperfect beyond the statement that "in a few months he had nearly recovered, and some months after he called upon me, and looked as well as any one could at his time of life."

November 23, 1850, Professor Parker operated at Bellevue Hospital on a case of chronic cystitis in the male. He states: "The object in view was to open a channel by which the urine could drain off as fast as secreted, and thus afford rest to the bladder, the first essential indication in the treatment of inflammation." The conception of treatment was perfect, and there has been no advance made since in the pathology. The patient died in a few days, and the autopsy revealed the fact that the kidneys had undergone degeneration. This case was published in the New York Medical Journal for July, 1851, vol. VI., and reported at length by Stephen Smith, M. D., assistant surgeon to the hospital. Although a favorable result was not obtained, it clearly establishes Dr. Parker's claims to priority for this mode of treatment of cystitis in the male. Previous to the reading of this paper before the State Society in 1867 I had been ignorant, however, of his views on this subject; and it is only a short time since that I have been able to obtain a copy of the journal containing the history of the case. Prof. Eve, of Nashville, reports the benefit derived from this mode of treatment in the male, after an operation performed in 1866, and the case is presented in Dr. Parker's paper.

At the last meeting of the State Society, February 7, 1871, Dr. Bozeman presented an interesting paper on "Urethrocele,

Catarrh, and Ulceration of the Bladder in Females," which was published in the New York Journal of Obstetrics for February, 1871.

Dr. Bozeman details the history and successful result of an operation for the relief of cystitis performed January, 1861, the artificial opening having been closed the following June. The patient was cured; and nine years after the operation had had no return of the disease. It is stated: "To Prof. Willard Parker is due the suggestion of opening the male bladder for the relief of catarrh, and this encouraged me to extend the practice to the female bladder, as I have described. Dr. Emmet and other American surgeons have *since* adopted the practice in case of vesical catarrh in the female, and I doubt not with equal success." . . . "Delay in the report of my case of ulceration was due to the suspension of all medical journals in the South during the war," etc. This statement is unfortunately calculated to give the impression that the American surgeons who have practiced this mode of treatment since 1861 were indebted to Dr. Bozeman. With all due credit, this is not correct, as until his paper was presented he had given the profession no opportunity of knowing that he had ever operated. He has certainly not done justice to himself in so long delaying his claims; for he could scarcely be ignorant that this had been the practice at the Woman's Hospital previous to and from the time of his coming to New York immediately after the war. I may also state that several cases of cystitis treated by this plan are detailed in my work on "Vesico-vaginal Fistula," published in July, 1868, and to his pen I have always accredited a flattering review of the book in one of the journals of this city.

Since the case referred to, from which the stone was removed in 1858, this mode of practice has been followed in similar cases, and the principle fully recognized. During the summer of 1861 I operated for the first time on a case of chronic cystitis in the female. The opening soon closed, and

no improvement in the condition of the patient took place. I shortly afterward made a larger opening, through which the urine freely escaped. Ten months later I closed the artificial opening, as the thickened condition of the bladder had then disappeared. I have never seen a case of disease of the bladder as extensive as this was without the existence of any kidney complication. The mucous membrane of the bladder had, to a great extent, been lost, and the walls had become so hypertrophied that the bladder, as a hard mass, could be felt contracted behind the pubes, and was exceedingly tender on pressure. This case had been of many years' standing, and her suffering had made a wreck of both body and mind. She came under my observation frequently until some two years ago, since which time I have lost sight of her; but I can vouch for the fact that the bladder had remained in a healthy condition for eight years after the operation. I regret that the notes of this case, as well as of several others which occurred in my private practice, should have been lost.

At a meeting of the New York Obstetrical Society, held by invitation of Dr. L. A. Rodenstein in December, 1870, I presented the history of a case which I had just operated upon by making an incision transverse to the axis of the vagina, and in which an excessive hemorrhage had occurred. Among the invited guests present was my friend Prof. James P. White, of Buffalo, who, in some remarks addressed to the Society, reminded me that he had assisted me at the operation in 1861, and, by a curious coincidence, was, I believe, present at the final closure.

During the autumn of 1862, shortly after her arrival in this country, an English woman, suffering from chronic cystitis, was admitted into the Woman's Hospital. She refused to submit to any surgical procedure, and shortly afterward died in consequence of the diseased condition of the kidneys. I mention this patient's case because she had been for some time under the care of Sir James Y. Simpson previous to

leaving Great Britain, and the chief objection made to the operation was that so high an authority as Prof. Simpson had never intimated the necessity for such a procedure. The credit of this mode of treatment has lately been claimed for Prof. Simpson by Mr. Lawson Tait. Whether the idea after this date occurred to him, or that he was really indebted to this country for it, is of little bearing; but by this case the fact is proved that previous to the summer of 1862 he was ignorant of the method, and treated his cases simply by injections into the bladder.

Cystitis is of frequent occurrence from the too early closure of a vesico-vaginal fistula, resulting from parturition and before the tissues have regained a healthy condition, or as a result of failure in the operation to approximate perfectly the edges along the bladder surface, and thus leaving some denuded portion exposed to the action of the urine. I have operated some fourteen times for the removal of calculi from the female bladder. Nearly all these cases had been operated on for the closure of a vesico-vaginal fistula by other surgeons or by myself. In nearly every instance the cystitis was of sufficient extent to necessitate leaving the opening unclosed after the removal of the stone. In the worst cases means were adopted to keep the opening patulous; in others of a milder character the same treatment was followed of washing out the bladder several times a day as long as the injection could escape by the vagina. I believe in every instance the opening closed within two weeks where no means were employed to prevent it, and often it would do so in nearly the same time notwithstanding efforts to keep it open. These cases recovered ultimately, I believe without an exception, although in several instances where, on account of the urging of the patient, the opening had been closed too soon, the operation had to be repeated.

This operation is not advocated in all cases of cystitis, for it is a fortunate experience that a large number, if seen early,

will readily yield to treatment. The necessary step in the beginning for success is, if possible, to recognize the exciting cause, that we may not lose time by treating the symptom alone. Neglect during labor to keep the bladder empty, exposure to cold, violence, and the habit of long retaining the urine, are the chief exciting causes of the most serious forms of chronic cystitis.

As some of the causes of irritability which may result in chronic cystitis, we may enumerate the different forms of dyspepsia from chronic derangement of the digestive organs, pressure of the uterus, and diseases of the rectum. With enlargement of the uterus, and partial or complete laceration of the perineum, this organ settles down on the floor of the pelvis, and by traction along the base of the bladder to the urethra chronic irritability of the bladder is frequently established. Retroversion of the uterus also, by which the cervix is thrown forward or upward, may excite the same condition. The existence of urethral polypi or other growths and ulceration of the canal must not be overlooked. It is necessary always to examine the condition of the rectum; for the presence of hemorrhoids will keep up irritation of the bladder as well as an unsuspected fissure.

I once gained great credit for the relief of an intractable case of irritable bladder by accidentally discovering a fissure of the anus, and healing that by lacerating the sphincter. This patient had been under the care of several excellent practitioners, who had treated the uterine condition with the idea that the bladder difficulty was due to it. There was no indication of any rectal trouble beyond the existence of habitual constipation, and after a movement of the bowels the pain in the bladder was excruciating. She had suffered for years with dysmenorrhea, and the uterus was both enlarged and anteverted. After the fissure was healed the irritability of the bladder subsided, and without additional treatment the dysmenorrhea ceased and the uterus gradually lessened in

size. It is often necessary to use some form of pessary, by which the neck of the uterus will be lifted up from the floor of the pelvis, even if it is anteverted by so doing, and the instrument should be so curved in front that all pressure at the urethra will be avoided. Irritation of the bladder is often excited by the relaxed condition of the upper portion of the vagina, which allows of chronic prolapse of the uterus. For its relief some modification of the operation for procidentia, by which the excess of vaginal tissue may be turned in, must be resorted to. With partial or complete laceration of the perineum, causing cystocele or rectocele, the appropriate operation on the vaginal wall will be necessary, as well as closure of the perineum.

So many causes exist by which a continued irritability of the bladder may be kept up until chronic cystitis has become established that it would be impossible to enumerate them at greater length. In the local treatment of the bladder the main dependence for relief rests in the frequent and proper manner of washing out the cavity. This operation the surgeon should perform himself if possible, using simply warm water in large quantities, to be injected with great care through a double catheter. After the injection, if the pain has been increased, it will be diminished greatly by a solution of morphine thrown into the bladder. Although the absorbing power of the bladder is very limited in a healthy state of the organ, yet in this condition it is sufficient; for such treatment is often more efficacious than the use of suppositories or anodyne injections into the rectum. When the injection of water can not be borne without increasing the irritation of the bladder, or when there has been no marked improvement in the case after a reasonable time, the operation for establishing a fistula must be resorted to. The patient should at least be given the option, with a reasonable expectation of success on the one hand, or on the other inevitable death from disease of the kidneys; and the surgeon fails to perform his duty

who does not present the case to the patient in this light. Unfortunately the disease is so insidious in its character that either relief is not sought until the condition of the bladder has become complicated, or the patient can not realize the danger with the necessity of resorting to any surgical procedure.

In the beginning, from the profuse local secretion with phosphatic urine, an accumulation of mucus takes place in the bladder. At first the urine is to a great extent evacuated, but in time the frequent efforts to force out the mucus induce inflammation and thickening at the neck of the bladder. As a consequence, a certain amount of stale urine is always retained, thus increasing the irritation of the bladder, until at length its parietes become thickened, its mucous membrane ulcerated, infiltration of urine to some extent occurs, abscesses form, and pelvic cellulitis is often occasioned. Long ere this the œdematous and thickened condition of the tissues has so far obstructed the mouths of the ureters that the urine can no longer enter the bladder freely. The ureters often become enormously distended, the inflammation from the bladder extends along them to the kidneys, these organs at length become disorganized from pressure by the accumulation of urine, and death ultimately results from uræmic poisoning. Before the last stage of the disease has been reached, the poor woman has experienced, through a series of years, an amount of suffering both of body and mind unequaled, I believe, by any other infirmity to which our humanity is subject. To alleviate this suffering these patients soon become addicted to the use of opium in some form, and the degree of tolerance of this drug which has come under my observation is almost incredible. I had a patient at one time suffering from chronic cystitis who had frequently taken ten grains of morphine at a dose; and she informed me that sometimes within the twenty-four hours half this quantity had to be taken, in addition, before her suffering could be palliated. I have frequently

noticed a tendency to a mucous diarrhea, which could alone be attributed to the excessive use of this drug, and with the frequent desire to evacuate the bowels the condition of the bladder became greatly aggravated.

The operation, as practiced for the relief of cystitis, is in itself a simple one; and if resorted to before the disease has advanced so far as to involve the kidneys, is as free from risk as any in minor surgery. Even under the more unfavorable circumstances the risk of the operation is justifiable; life may be prolonged, and a great degree of comfort obtained, in allaying the persistent efforts to empty the bladder.

To the effects of the anæsthetic I attribute the chief danger attending the operation in the advanced stages of the disease, while from the irritable state of the bladder its use is indispensable. As the kidneys are barely able to perform their function sufficiently well to preserve life, the balance is easily lost in the attempt at elimination, and death from uræmia rapidly takes place. It has been denied that the kidneys take any active part in the elimination of ether from the blood, but I am convinced that this view is incorrect. I have often detected the smell of ether in my own urine hours after I had performed some prolonged operation, where it had been administered to the patient. I have had no experience with the use of any other anæsthetic in this condition, but on theoretical grounds would consider the use of the nitrous oxide gas as the least objectionable, and particularly as the operation is one of so short duration. Unfortunately we can not judge in any case of long standing as to the actual condition of the kidneys, so that the consequences which may follow must be fully appreciated both by the operator and the patient.

Many objections have recently been made to surgical interference in these cases of chronic cystitis. While the chief danger in relation to the state of the kidneys has been entirely overlooked, the exceptions taken have been based entirely on theoretical grounds, with really no foundation in practice.

We are all aware that most plausible objections may be made against any operation in surgery, and that the most simple in character is not free from danger under all circumstances. This operation may be regarded as an innovation, but experience has long since taught that it is founded on correct principles. The advance which will be made in the future will be an appreciation of the necessity for an early resort to its performance, before delay has placed a comparatively simple condition beyond the scope of any remedial means yet known to the profession.

In my work on Vesico-vaginal Fistula I describe the mode of operating on page 43, and give the history of a case where the same operation was performed for the removal of a stone from the bladder. An anæsthetic was administered, the patient placed on the left side, and Sims's speculum introduced. Then "a sound, somewhat abruptly curved an inch and a half from its extremity, was introduced through the urethra. While held by an assistant, with its point firmly pressing in the median line against the base of the bladder, a little behind the neck, the projecting tissue on the vaginal surface was seized with a tenaculum, and divided by a pair of scissors directly on the point of the sound until it could be passed through into the vagina. With the sound remaining in the opening as a guide, one limb of a pair of scissors was passed alongside into the bladder, and the vesico-vaginal septum divided backward in the median line. By this mode, especially where the vagina is of the natural size, the operation is extremely simple, and is completed in a few minutes. The object in cutting on the point of the sound is to be sure that the bladder and the vaginal surface are divided in correspondence, for there is so much mobility of one surface over the other that it is exceedingly difficult to enter the bladder unless the parts are transfixed. I have frequently closed the opening immediately after removing a stone, as in the operation for fistula, with the same after-treatment. In this case, however,

I determined to leave it open a year for the relief of the chronic cystitis, as the bladder would thus be kept empty, and the chief source of irritation consequently removed; by remaining at rest it would gradually recover its tone." "I directed that the bladder should be washed out several times a day with large injections of warm water, slightly acidulated by adding a few drops of nitric acid, as the most direct way of correcting the alkaline state of the urine, due to the condition of the bladder itself. * After three months' treatment the patient had improved so much, and was so anxious to return home, that on the 20th of June I reluctantly closed the fistulous opening, using eight sutures, which were removed on the following day. July 20, 1866, she returned home apparently cured of the cystitis, and able to retain her urine without difficulty during the night. It remains to be seen whether the opening was closed too soon, for with a recurrence of the inflammation the calculus will form anew."

This woman was well some months after leaving the hospital, and promised to return at once in case of any recurrence of irritation of the bladder. As she has not done so, I am fully satisfied that she has remained well.

The mode of operating, as described, can be but little improved upon from its simplicity. The median line has been preferred for the direction of the incision, as for all practical purposes the course is free from blood-vessels of any magnitude, without the opening be extended too near the cervix or to the neck of the bladder.

Dr. Bozeman, in the paper already referred to, describes his method of operating as follows: "To give them free vent (the morbid products constantly accumulating), an aperture the size of *half a dollar* is made into the bladder through the vesico-vaginal septum, just above the vesico-urethral orifice. When the patient is placed in the knee-chest position, and my self-retaining speculum introduced, the operation is done without an assistant, and with the greatest dispatch. A

pointed knife with a narrow blade, a curved scissors, and delicate tenaculum suffice. First pierce the septum at the point indicated, then cut right and left at least half an inch each way. With the scissors the operation is easily completed, and then the extent of muscular hypertrophy may be ascertained, as well as the condition of the vesical mucous membrane."

The base proper of the bladder may be represented as a triangle, the mouths of the ureters being situate at each extremity of the base, and the vesico-urethral orifice at the apex. This triangular space maps out the surface where the bladder and vagina are in the closest contact, being connected elsewhere by loose cellular tissue. Just outside of the line of the ureters, in the sulcus on each side, run the large blood-vessels to and from the lower portion of the uterus and neighborhood. I have made a number of post-mortem examinations of the healthy bladder, both *in situ* and after the removal of the pelvic organs *en masse*. In no instance have I found the distance from the mouth of one ureter to the other, or from either to the orifice of the urethra, greater than an inch, these forming a triangle of equal sides. When disease has existed, and the bladder been long contracted, the distance between these points in all probability would be somewhat lessened. The diameter of half a dollar is one inch and an eighth, while a circle including three points, as I have described, at an inch apart, would have a diameter of a little less than an inch and two eighths. It is very evident therefore that in less skillful hands there would be some danger of removing the mouths of both ureters, together with a portion of the neck of the bladder, and no little risk, at the same time, of cutting into the large blood-vessels laterally, running along the vagina, outside of the bladder.

It is true that in the position recommended the vagina, by the weight of the uterus and by atmospheric pressure, would be fully dilated, and at the same time the distance between

the line of vessels would be greatly increased, but no influence could be brought to bear which would increase the distances between the three given points within the bladder. It is true also that in the formation of a fistula, after parturition, we often find as large a slough thrown off from the septum, and the opening resulting remains even much larger than the one proposed by Dr. Bozeman; but the neighboring tissues for some distance beyond the margin of the slough become blended together by inflammation before its separation, and the fistula is afterward increased or diminished in size, as tension may be exerted by the contraction of these tissues.

In theory, there can be no necessity for an opening larger than that which would equal the capacity of the ureters, that the bladder may be thus kept empty. In practice, however, the incision is made larger at first than this indication would call for, from the fact that, with all the care that can be taken to prevent it, the greater portion will close too soon; and at first it is a great advantage to have so free an opening through which the accumulated mucus in the bladder may be freely washed out. The plan of cutting out a small piece is a good one, as the opening can then never entirely close of itself; but to do so would be evidently attended with more risk than the simple incision, even in the hands of an experienced operator.

Various means have been resorted to for the purpose of keeping the artificial opening patulous. In several cases I have used with advantage a hollow glass stud, made from tubing half an inch in diameter, and not unlike a spool in shape, which is buttoned into the slit. The portion of the rim to remain within the bladder requires to be but little more than a slight flare, with the edge turned over, to keep the instrument *in situ*; while the vaginal rim may be larger, to prevent its slipping into the bladder. It will remain loose, with sufficient play to prevent the parts from healing up too tightly around; and for its removal only a pair of forceps is

necessary, by which one side may be turned up for the other to escape. I have always made them myself, of the best quality of glass, and have had them remain for weeks undisturbed; yet in some instances, when they have been longer than the thickness of the vaginal septum, a great deal of irritation has resulted. As a rule, I think it advisable at first to rely upon the careful introduction of the finger; but after a few days, when the irritation of the parts has somewhat subsided, and the incision begins rapidly to close, the glass stud may be used with great advantage.

I will now briefly give the history and treatment of several cases in detail, with the view of illustrating some of the difficulties and complications attending. In making the selection I have intentionally presented some of the cases with which I have had the most difficulty, wishing rather to give prominence to the dangers than to mislead.

I have operated by this method during the past ten years, in hospital and private practice, in some ten or twelve cases of chronic cystitis due to disease of the bladder itself. The number is too small to be of any statistical value, since I have never been able to ascertain the subsequent condition of several patients after their discharge from the hospital; and having no complete records of those treated in private practice, I do not wish to trust to my recollection. It is sufficient for all practical purposes, however, to state that I have been able to keep several cases under observation for a number of years after closing the fistula, and that there has been no return of the cystitis, where death would have resulted long since had this mode of treatment not been resorted to. Experience has certainly taught that while the operation may palliate at any stage of the disease, the benefit, as I have already stated, will be in ratio to the time of performing it.

Mrs. Ann Kelley was admitted into the Woman's Hospital on May 13, 1870. This patient had been in the hospital

some time ten years before, and had been operated on by Dr. Sims for the closure of a large vesico-vaginal fistula, by which the cervix uteri had been turned into the bladder. She had remained well until eight years after her discharge, when irritation of the bladder set in, and rapidly increased. Her condition was a miserable one at the time of admission, and it was impossible to make a thorough examination. It was ascertained by means of the endoscope that the mucous membrane of the bladder was ulcerated. Local applications were made by means of this instrument, and the bladder was washed out from time to time, but with great suffering. As she received no benefit from local treatment, an anæsthetic was administered, and after a careful examination an encysted stone was detected. An incision was at once made through the vesico-vaginal septum, and with some difficulty the calculus, as large as a hazel-nut, was turned out of its bed in the posterior wall of the bladder. It was composed entirely of phosphate of lime. The mucous membrane of the bladder was found lost to a great extent, each denuded portion covered with a phosphatic deposit, and some thickening of the walls of the bladder existed. The bladder was washed out every day thoroughly, by placing the patient on the back with a bed-pan under her hips. Two fingers of the left hand pressed back the perineum as they were inserted into the fistulous opening to separate its edges, while the warm water in large quantities was carefully thrown into the bladder by means of a Davison's syringe held in the other hand, the smaller nozzle of the instrument being introduced either through the urethra or directly into the opening. Afterward the point of a sound was drawn along the angles of the opening to retard its closure. The edges of the incision healed rapidly, and the patient was in a condition to return home June 20th, with the urine freely escaping through the artificial opening. She was readmitted to the hospital October 8, 1870. As the fistula had to a great extent closed, and the

patient, as she improved, had neglected somewhat to use the injections, it was decided that the bladder should be washed out daily, with extra care, through a double catheter.

November 15th, the bladder being apparently in a healthy condition, its closure was determined upon. The opening was not larger than a pin's point, and situated near the neck of the bladder. It was closed with six sutures, and at the same time a mass of loose tissue at the neck of the bladder was turned in, as in the operation for cystocele, for fear that if left it might prove a source of irritation to the urethra.

November 25th, the sutures were removed, and the operation proved successful. The patient was discharged cured December 12, 1870, and she has remained well to the present time.

This case was of no particular interest, but to illustrate the rapidity with which recovery from chronic cystitis due to a stone in the bladder takes place.

Mrs. Mary B., aged twenty-four, was admitted to the hospital October 17, 1868, from Goshen, N. Y., with a vesico-vaginal fistula of four months' standing, after a labor of thirty hours. There had been a loss of two thirds of the lower portion of the base of the bladder, extending from one ramus to the other, without involving the urethra. In consequence of contraction of cicatricial tissue along the lateral walls of the vagina, the canal had become shortened, and the opening was drawn into the shape of a parallelogram. The fistula was closed, November 7th, with thirteen interrupted sutures, by Dr. John G. Perry, assistant surgeon to the hospital, the operation being a very difficult one, owing to the peculiar shape of the fistula. The sutures were removed on the tenth day, and the union throughout the line was perfect, notwithstanding that great traction existed.

December 18th, Dr. Perry operated again, to close several small openings in the line, which had been produced by the great strain on the parts. This operation proved nearly suc-

cessful, leaving but one small opening at the extreme end of the line, to the left, near the cervix. The patient returned home, but was reädmitted February 15th, when it was found that this small opening had increased to nearly an inch in length. I closed it myself March 6th, using seventeen sutures. On bringing the edges of the fistula together a pucker was formed at each end, so that it was necessary to extend the denuded surface for some distance on the vaginal surface before the folds became reduced to the common vaginal level. The sutures were removed March 26th, and the patient was discharged cured March 31, 1869.

A few weeks after her discharge she began to suffer from some irritation of the bladder. This increased by degrees, and occasionally the urine was mixed with blood. She became pregnant, and was delivered with forceps February 14, 1870. Gradually the difficulty with the bladder became greater, and she was again admitted to the hospital March 31, 1871, suffering fearfully from chronic cystitis. It was with the greatest difficulty and suffering that a double catheter could be introduced for the purpose of washing out the bladder, and at length so much so that it became necessary to administer an anæsthetic every other day in order to effect it properly. As but little improvement had taken place April 21st, I made a transverse opening just beyond the neck of the bladder, an inch in length, and somewhat crescentic in shape. This was done in consequence of the great loss of tissue, there being not room enough between the cervix and neck of the bladder to make the incision in the axis of the vagina. When the finger was passed into the bladder, its walls were found greatly thickened, the mucous membrane destroyed to a great extent, and coated with the most offensive phosphatic deposit, which when removed caused bleeding from the surface below. Her sufferings were so great, even after the operation, that it was still necessary to give her an anæsthetic every other day before washing out the bladder, and

often a gallon of warm water was used at a time before the deposit could be removed. A week after the operation I introduced a glass stud into the opening to keep it from closing. This treatment (by injection) was continued daily until August 7th, when the glass instrument was removed, as it had begun to excoriate the posterior wall of the vagina. Her general health began to improve rapidly, and she was by this time free from pain, except when the bladder was syringed. When the finger was passed within the bladder, its surface was felt to have become smoother, but was still tender on pressure; yet the improvement had been very great. The injections were continued until October 1st, with half a drachm of carbolic acid to the pint of water. This had constituted the treatment, with the exception of the application of a weak solution of nitrate of silver to any denuded point which could be detected to lessen the phosphatic deposit. From some unexplained cause a sudden relapse occurred, with a chill and symptoms of pelvic inflammation, and her condition became apparently worse than before the operation. With fever, she suffered from pain over the hypogastrium; the urine became high-colored and filled with urates. It was unbearable to introduce the finger into the bladder through the opening, the edges of which had long since healed and ceased to be sensitive. Notwithstanding every care the whole vaginal surface became denuded of its mucous membrane from the irritating character of the urine, and coated with the phosphatic deposit. The labia inflamed, and became so sensitive that the slightest examination could not be made except under the influence of an anæsthetic. In a few days the urine was as offensive as if mixed with the contents of an old pelvic abscess. By degrees the vagina could be syringed out several times a day, and she was able to take hot sitz-baths. With anodynes, tonics, and other treatment, she was placed on ten drops of dilute nitric acid three times a day. As the irritation of the vagina lessened somewhat, its excoriated surface and

the now raw edges of the fistula were touched every other day with a solution of nitrate of silver in spirits of nitric ether (forty grains to the ounce), and on drying the surface collodion was freely applied. She began now rapidly to improve, and the free use of the collodion proved of the greatest advantage, not only in protecting the parts from the urine, but also as a local anæsthetic.

November 14th, she had now gained so rapidly that the finger could be introduced into the bladder without causing pain, and there remained not the slightest vestige of the cystitis. I closed the fistula, using eight sutures; and in denuding removed the surrounding tissues freely, with some doubt as to the success of the operation in consequence of the cicatricial character of the edges, which had resulted from the frequent use of nitrate of silver. She was placed in bed, a small quantity of opium was ordered daily, with a light, nutritious diet. A sigmoid catheter was retained in the bladder, and only removed night and morning for the purpose of cleaning it. Her condition remained comfortable until the sixth day, when a small quantity of urine began to pass by the vagina.

November 22d, the sutures were removed, when it was found that a small opening existed near the center of the line where a suture had cut out, due, it was thought, to traction and low vitality of the parts. A catheter was retained in the bladder for several days longer, when the quantity of urine lost diminished greatly.

January 20, 1872. This patient has been retained under observation. She is entirely free from all trouble of the bladder, and is now in perfect health, having gained some twenty pounds in weight. The opening is now so small that when lying on the back she has retentive power. The bladder is never entirely emptied except through the urethra, so that if the cystitis was not cured there would long since have been evidence of it. The sound now can be passed into the

bladder at any point within its cavity, and without causing the slightest pain or irritation. To close the little valvular opening would be but a trifling matter, and it has been deferred with the view of keeping her under observation.

Kate Smith, unmarried, aged twenty-seven, a native of Ireland, was admitted to the hospital June 10, 1868, from the city, with chronic cystitis.

She had been in good health until her emigration to this country in 1863, when she was attacked with small-pox three days after her arrival, and continued an invalid for eight months afterward. Her health slowly improved, but she never regained her previous strength, and had occasionally attacks of inflammatory rheumatism. In March, 1866, while attempting to carry a table, she tripped, and falling forward received a blow on the lower portion of the abdomen, from which she suffered great pain at the time. It diminished to a feeling of soreness, but lasted until the following June, when she took a cold bath, from which she got chilled. She was obliged to go to bed in consequence of sharp, shooting pains in the lower portion of the abdomen, accompanied with a frequent desire to empty the bladder. From this time her suffering continued; she was never free from irritation of the bladder, and at the time of her admission to the hospital her symptoms were all those of well-marked chronic cystitis. She was placed under a careful constitutional treatment; diluents and other agents were used to correct the condition of the urine, and the bladder was carefully washed out daily, but without in the slightest degree benefiting her condition. So great was her suffering that, July 1st, I decided to operate without further delay, and made the opening in the usual manner along the median line. The interior of the bladder was apparently a mass of granulations, and from some accidental cause the hemorrhage was so profuse from the cavity itself that it was necessary to inject a saturated solution of alum, and, this failing, a quantity of the persulphate of iron

and water, before it could be arrested. On the fifth day, as in the previous case, the vagina became coated with a phosphatic deposit from the urine, and this condition added greatly to her suffering. The opening was kept from closing by passing the finger gently within, and at the same time the bladder and vagina were carefully washed out with warm water several times a day. On the tenth day after the operation symptoms of peritonitis were developed. She was at once brought thoroughly under the influence of morphine to semi-narcotism, and turpentine stupes were applied to the abdomen. As far as it was possible to do so in her condition, the bladder was daily washed out with hot water by the vagina. She was placed on five grains of quinine three times a day. Stimulants had to be resorted to, and finally increased to an ounce of whisky every half hour, with beef-tea, milk, and eggs freely.

July 20th, she was seen in consultation with Drs. George T. Elliot and George A. Peters, of the Consulting Board, when it was decided that the case was complicated with pelvic cellulitis. A large blister was applied to the lower portion of the abdomen, and five grains of iodide of potassium were ordered three times a day.

July 22d, her pulse averaged 131, respirations 12, and the bowels moved twice during the day, but were controlled by an opium enema.

July 24th, nine A. M., pulse 104, countenance good, tongue moist, and the tympanites diminished. She was placed again on quinine and brandy, and the iodide of potassium stopped. During the following night the bowels moved several times and with great pain, but they were held in check by an opium enema. The morphine was reduced to five drops of Magendie's solution every hour. She had been sweating profusely, but it was considered due to the large quantity of morphine that she had been taking.

July 25th, pulse 118, respirations 12, skin pleasant in temperature, with less sweating since reducing the quantity of

morphine. With still a tendency to diarrhea, the tongue was moist but furred, and she now complained of feeling exhausted. The abdomen was decidedly less tender on pressure and the tympanites had diminished greatly. At noon the pulse suddenly reached 136, the skin became hot and the face flushed. The morphine was again ordered to be increased to ten drops of Magendie's solution every hour. During the day the bowels moved three times, and at six P. M. the pulse was still 136. The action of the bowels was checked by twenty-five drops of the acetated tincture of opium, with two drachms of tincture of kino in starch-water by injection into the rectum.

July 26th, pulse 120; the bowels had moved frequently during the night, and her sleep had been much disturbed by pain after each evacuation. Her tongue was moist, with but a slight increase in the temperature of the skin. There was but little change in her condition until August 8th, when she began to convalesce. She was put on a tonic, composed of iodide of potassium, iodide of iron, strychnine, and sulphate of quinine, which proved of great benefit.

September 1st, she began to walk about the ward, and the cystitis to improve.

October 15th, the patient had now regained her health in a great degree, and the fistula remained well open. The introduction of the catheter through the urethra, however, was still painful; the injections were therefore thrown into the bladder along the finger passed through the fistula, which allowed of its free escape.

January 24, 1869. The cystitis had now decidedly improved, and the catheter could be introduced by the urethra without pain, so that the daily injections were administered in this direction with a free escape by the vagina. The patient continued to gain in health and strength rapidly.

March 1st, the injections of warm water had been continued to date, and from time to time a weak solution of nitrate of silver had been applied to any denuded portion of

the bladder which could be brought into view, and the solution of the persulphate of iron had been used for the same purpose. Her general health began now to suffer somewhat from her long confinement, with loss of appetite and strength. The cystitis, however, had steadily improved. In consequence of the inflammation of the mucous membrane of the vagina during her illness, the canal became constricted by a circular band just beyond the fistula, so that the extremity of the index finger could scarcely be admitted. The uterus had become partially retroverted and fixed from the attack of cellulitis, and to this was attributed the back-ache and pains about the hips of which she now complained. There had been a scanty menstrual show but twice during the previous summer. The cystitis had improved so much that it had only been necessary to wash out the bladder three times a week, but a small quantity of dilute nitric acid was still added to the injection.

June 1st, Dr. Newman made a careful examination of the bladder with the endoscope, and found no longer any remains of the disease. The fistula was closed, using eight sutures; they were removed on the tenth day, and the union was perfect. Ten days afterward, on sitting up, it was noticed that a portion of urine escaped, but by the urethra, as was found on examination.

June 29th, she began to complain of some irritation and pain in the urethra, which was attributed, as well as the loss of urine, to the long use of the catheter. By means of the endoscope a granular spot was discovered in the urethra, near the neck of the bladder, which was painful on pressure. To this a solution of nitrate of silver was applied.

July 18th, after three applications by Dr. Newman, this spot healed, and the retentive power was regained. She was discharged from the hospital on this day, cured apparently of all disease, and her general health in good condition, after having been daily under treatment for over a year.

Reädmitted November 6, 1869. Had remained well for several weeks after her discharge, when the pain returned in the urethra, with some irritation of the bladder if the urine was retained beyond a given time. Under Dr. Newman's care the granular point in the urethra was soon healed again. The irritation of the bladder was evidently due to the long-contracted condition of the organ, and had to be dilated before the urine in any great quantity could be retained. The bladder was gradually distended by injecting, day after day, a large quantity of water, which was retained for a short time before being passed. This patient was kept in the hospital under observation until June, 1870, during which time attention was directed to her uterine condition. She received no treatment for the bladder for six months previous to her discharge; the organ became fully dilated, and regained entirely its normal condition.

Mrs. Ellen O'Brien, aged thirty-five, was admitted to the Woman's Hospital November 8, 1867. Menstruated for the first time at sixteen years of age, with great pain, lasting from four to five days, and rather free in quantity. She married at seventeen, and gave birth to her only child within a year. Four months after marriage her husband died. She married again in 1864, and the second husband died a year afterward.

Her general health from childhood had been delicate. Three years previous to admission she received a severe fall, and from that time she had never been free from irritability of the bladder. This gradually increased, until at length with constant pain she was obliged to empty the bladder at least every half hour during the night and day. The urine was sometimes clear, but generally of a dark, smoky color, with often some sediment, and frequently tinged with blood. She was found suffering from chronic cystitis, with some thickening of the walls of the bladder. The uterus was retroverted and fixed in position from some previous attack of cellulitis. The organ was normal in size, but the cervix was

indurated and small, with "os" nearly closed. With injections into the bladder an attempt was made at the same time to correct, if possible, the position of the uterus, as the cervix was pressed upward against the base of the bladder and might prove a source of irritation. The finger, by the rectum and vagina, was the only means used to lift up the fundus, for fear of exciting the old pelvic inflammation. This was only partially successful; the cervix was blistered from time to time with the acetic solution of cantharides, with the view of lessening the induration, and sponge-tents were also carefully used for the same purpose, and to relieve the dysmenorrhea by opening the os. Great pains were taken to improve her general condition. With the view of acting on the bladder, she was placed at one time on a mixture containing ten grains of tannin to the dose; large doses of old muriated tincture of iron were used, from its containing more free acid than the fresh preparation, and I believe she at one time readily took a drachm three times a day. An infusion of the *triticum repens* was also freely given for some time.

March 10, 1868. In consequence of a slight exposure to cold she suffered from a severe attack of pelvic peritonitis, lost what little benefit had been gained by treatment, and was several months convalescing. At length, after nearly seven months' local treatment, having exhausted every local and constitutional resource with but little benefit, the operation was recommended. After fully explaining to the patient the risk of life, even in her debilitated condition, should the operation again light up the subacute pelvic inflammation, which still existed, she decided to submit to the operation with all its dangers in preference to remaining in her present condition.

June 2d, the patient was placed under the influence of ether, and with the concurrence of Drs. Alfred C. Post, one of the consulting surgeons, and H. P. Farnham, her former physician, the artificial opening was made. The incision was

an inch and a half in length, extending from the neck of the bladder nearly to the cervix uteri. The interior of the bladder was found in the usual condition, with the walls thickened and corrugated, but with less ulceration of the mucous membrane, the latter condition being due probably to the length of time she had been under treatment.

June 23d, with the greatest difficulty the fistula had been kept open, but had now become so small that the finger could with the greatest difficulty be introduced.

July 18th, she was discharged, greatly improved both in her local and general condition, to return in the fall.

October 27, 1868, she was readmitted to the hospital, having been under observation during the summer as an outdoor patient. Her general health had not improved to any great extent, and she had suffered greatly from the fistula, which twice nearly closed. The adhesions were broken down so as to admit the finger, and at length it remained permanently open, large enough to admit a No. 6 bougie, through which all the urine escaped. During the winter the regular treatment was kept up, with much improvement in the cystitis, and the walls of the bladder became softer. Much thickening, however, and induration at the neck of the bladder remained, with tenderness in the urethra, making it unbearable to introduce a catheter into the canal.

June 4, 1869. For several months past a solution of morphine, containing eight grains to the ounce, had been thrown into the bladder, after washing it out with warm water. This plan was followed with great benefit, so that there was decidedly less tenderness on pressure in every portion of the bladder, but she continued to complain whenever a catheter was introduced.

June 9th, a relapse occurred, apparently without cause, with a constant desire to empty the bladder, although the urine all escaped freely by the vagina. Dr. Newman kindly examined the bladder for me with the endoscope. Its mucous

membrane was found to be now in a normal condition. As the instrument was slowly introduced into the urethra every portion of the canal was carefully inspected. At first nothing could be found, but at length a minute granular point was detected on the left side, about half an inch from the orifice, intensely red, and painful to touch. Churchill's solution of iodine was applied, giving much pain, which lasted eight hours.

June 16th, the patient was again examined, and it was found that no improvement had taken place. The iodine application was repeated, with less pain than after the previous examination.

June 21st, a weak solution of nitrate of silver was applied to the ulcerated point, and repeated on the 24th and 28th inst. The patient complained a great deal of pain after each application, but the surface gradually healed. She remained in the hospital during the summer without further treatment beyond the injection of water into the bladder. In December the fistula was closed; but on removing the sutures it was found that no union had taken place, in consequence of the cicatricial character of its edges, resulting from the frequent application of the nitrate of silver. As her general health was still poor, the fistula was not again closed until May 31, 1870; seven sutures used, after removing with a pair of scissors the vaginal tissue around the edges of the opening.

June 9, 1870, the sutures were removed, and the edges were found firmly united. She was discharged cured July 18th, having been two years and some eight months under daily observation and treatment. After her discharge her general health improved without any further trouble with the bladder. She continued well, and on inquiring to ascertain her present condition, I learn that within a short time she has returned to Ireland.

I have had but one death follow the operation, the history of which is given in my work on Vesico-vaginal Fistula, page 237. "Case LXXIV—Cystitis resulting from cold, of eighteen years'

duration, followed by a pelvic abscess, which soon afterward opened into the bladder and vagina. Fifteen months previous to admission incontinence of urine suddenly took place, with partial relief of the cystitis afterward. The vesico-vaginal sinus was enlarged, so as to allow of the free escape of urine. Death from uræmia forty-eight hours after the operation." The post-mortem examination showed the existence of chronic tuberculous peritonitis, the left kidney was enlarged, and sufficiently dilated to contain three or four ounces of fluid, and the ureter on that side was also greatly dilated. The right kidney had been entirely destroyed by tuberculous deposit, which had undergone cheesy degeneration, leaving scarcely a trace of the kidney structure. Her death was due to the effect of ether, by which the diseased kidney became congested above the secreting point.

With the exception of a patient who suffered from an attack of peritonitis, due to accidental exposure a week or more after the operation, I have met with but little difficulty in the after-treatment of other cases, and therefore have thought it unnecessary to extend this paper to a greater length.

